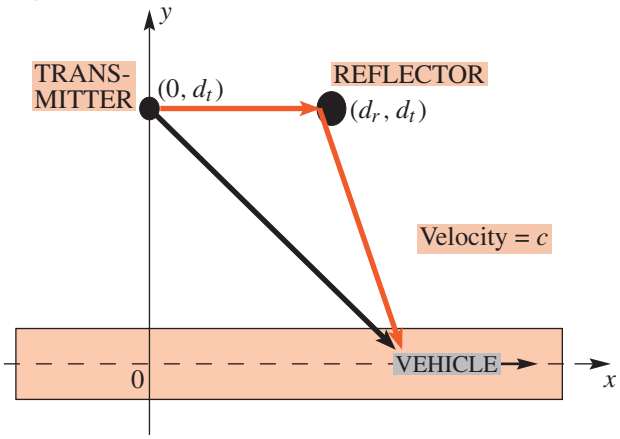
SP First ERRATA. These are mostly typos, but there are a few crucial mistakes in formulas. Underline is not used in the book, so I've used it to denote changes.
JHMcClellan, April 11, 2004

1. page 10*, Figure 2-4, last line of text in figure: $\Longrightarrow \underline{x} = r\cos(\theta)$

2. page 13*, righthand column, last line of text, change 3 to 2,
... negative slope of $-\frac{2}{3}$ for $\frac{1}{2} < t \leq \underline{2.}$ Now ...

3. page 34*, Figure 2-21, The diagram of the original figure does not correspond to the equations given in the problem. The general formula for the distance off the reflector, d_2, is $d_2 = d_r + \sqrt{(x - d_r)^2 + d_t^2}$. The figure should be replaced with the one below:



4. page 41, (bottom left), The CDROM citation should read:
LAB: *#3 AM and FM Sinusoidal Signals*

5. page 44*, 2nd line, left hand column, change the sentence to read:
Since $T_0 = 1/f_0$ is the smallest possible period, it is also the fundamental period.

6. page 49, equation (3.25) ***Orthogonality Property***

7. page 53, (2nd line of equations for a_k),
denominator should be: $-j(2\pi/T_0)k$, so we would have

$$= \left(\frac{1}{T_0}\right) \frac{e^{-j(2\pi/T_0)k(\frac{1}{2}T_0)} - e^{-j(2\pi/T_0)k(0)}}{-j(2\pi/T_0)k}$$

8. page 56, 2nd line of equation(3.37),
exponent in exponential needs changing, should be: $e^{-j(2\pi/T_0)kt}$. The entire line should read:

$$+\frac{1}{T_0}\int_{\frac{1}{2}T_0}^{T_0} (2(T_0 - t)/T_0)e^{-j(2\pi/T_0)kt}\,dt$$

9. page 63, righthand column, line 18, (insert a space) ...signals, such as a Touch-Tone phone.

10. page 83, The CDROM citation should read:
LAB: *#3 Chirp Synthesis from Chapter 3*

11. page 91, The CDROM citation should read:
DEMO: *Reconstruction Movies*

12. page 111, The CDROM citation should read: **LAB:** *#6 Digital Images: A/D and D/A*

13. page 123*, The convolution table has a notation problem. $h_1[n]$ and $h_2[n]$ are swapped and we should have written $h_2[k]h_1[n-k]$. Also, in the equation above the table, we should write: $y[n] = h_2[n] * h_1[n]$.

n	$n<0$	0	1	2	3	4	5	6	$n>6$
$h_1[n]$	0	1	1	1	1	0	0	0	0
$h_2[n]$	0	0	1	1	1				
$h_2[0]h_1[n]$	0	0	0	0	**0**	0	0	0	0
$h_2[1]h_1[n-1]$	0	0	1	1	**1**	1	0	0	0
$h_2[2]h_1[n-2]$	0	0	0	1	**1**	1	1	0	0
$h_2[3]h_1[n-3]$	0	0	0	0	**1**	1	1	1	0
$h[n]$	0	0	1	2	**3**	3	2	1	0

14. page 126, The CDROM citation should read:
LAB: *#7 Sampling, Convolution, and FIR Filtering*

15. page 132, 3rd line of Example 6-2, Missing $-\pi/3$ which should be colored.
... and $\angle H(e^{j\pi/3}) = -\pi/3.$

16. page 133, righthand column, 2nd line, algebraic steps in (6.6) show that $y[n]$ can finally be expressed as a cosine signal.

17. page 153, righthand column, middle, $dsty$ in the middle of the equation should be deleted.

$$
\begin{aligned}
& H(e^{j2\pi(250)/1000}) \\
& \quad = \frac{\sin(\pi(250)(11)/1000)}{\sin(\pi(250)/1000)}\, e^{-j2\pi(250)(5)/1000} \\
& \quad = 0.0909 e^{-j\pi/2}
\end{aligned}
$$

18. page 156, (bottom right), The CDROM citation should read:
LAB: *#9 Encoding and Decoding Touch-Tones*

19. page 174, Exercise 7.6, equation for $w[n]$ should have minus sign instead of plus:
$w[n] = x[n] - x[n-1]$

20. page 176, The CDROM citation should read:
DEMO: *Three Domains - FIR*

21. page 181, first paragraph of Section 7-7 should read:
Now we can exploit our new knowledge to design filters with desirable characteristics. In this section, we will look at a special class of bandpass filters (BPFs) that are all close relatives of the running-sum filter.

22. page 219*, Example 8-11 (caption), **Example 8-11: Long Division**

23. page 241*, in Problems **P-8.13** and **P-8.14**, $\mathcal{S}_6$ is wrong. The upper limit on the summation needs to be 3, not 2; otherwise, no match is possible.

$$\mathcal{S}_6: \quad y[n] = \sum_{k=0}^{3} x[n-k]$$

24. page 250*, Figure 9-5 (caption), Scaled unit-impulse signal is symbolized...

25. page 264, Figure 9-13(a), Label on y-axis contains a "gamma," should be: $x(\tau)$

26. page 264, Figure 9-13(b), Label on y-axis appears to have a light gray vertical bar after the equals sign. This is only visible in the PDF file. Should be: $g(\tau) = x(-\tau)$

27. page 295, The CDROM citation should read:
LAB: *#13 Numerical Evaluation of Fourier Series*

28. page 302, The CDROM citation should read:
LAB: *#15 Fourier Series (Ch. 12)*

29. page 312*, The following derivation should be written on two lines instead of three; otherwise, the equals sign is ambiguous.

$$\begin{aligned} |X(j\omega))| &= \left| \int_{-\infty}^{\infty} x(t)e^{-j\omega t}dt \right| \\ &\leq \int_{-\infty}^{\infty} \left| x(t)e^{-j\omega t} \right| dt \;=\; \int_{-\infty}^{\infty} |x(t)|dt \end{aligned}$$

30. page 319*, line 8, righthand column, (insert comma)
necessary condition, for having a Fourier transform.

31. page 326, line 11, righthand column,
...we showed in (10.3)...

32. page 329*, equation in righthand column is missing T^2,

$$y(t) = x(t) * h(t) = \frac{1}{2\pi} \int_{-\infty}^{\infty} T^2 \left(\frac{\sin(\omega T/2)}{(\omega T/2)} \right)^2 e^{j\omega t} d\omega$$

or T could be removed from the denominator and it could be written as:

$$y(t) = x(t) * h(t) = \frac{1}{2\pi} \int_{-\infty}^{\infty} \left(\frac{\sin(\omega T/2)}{(\omega/2)} \right)^2 e^{j\omega t} d\omega$$

33. page 349*, Figure P-12.4(b), input signal to first block should be $x(t)$, instead of $x[n]$

34. page 351, line 1, righthand column,
remove the words "filtersFrequency selective" so that it reads:
... *frequency selective* filters. In this section,...

35. page 354*, Figure 12-9, 2nd line of caption, (subscript not italic)
...to give the output signal $y_{\rm lp}(t)$.

36. page 355, The CDROM citation should read:
LAB: *#14 Design with Fourier Series*

37. page 364, Figure 12-20, misspelled word inside the first block: Half-Wave Rectifier

38. page 368*, equation (12.40), second line is missing n; it should be:

$$= x(t) \sum_{n=-\infty}^{\infty} \delta(t - nT_s)$$

39. page 379, Figure 12-35(d), the rightmost label $2\pi\gamma$ contains an extraneous γ; should be 2π

40. page 381*, Problem **P-12.2** has ω_{co1} and ω_{co2} switched, because the natural assumption is that ω_{co1} is the lower passband cutoff frequency, while ω_{co2} is the upper one. Thus, the natural assumption is that $\omega_{co1} < \omega_{co2}$. To correct this equation (12.76) should be changed to:

$$h_{\rm bp}(t) = \frac{\sin(\omega_{co2} t)}{\pi t} - \frac{\sin(\omega_{co1} t)}{\pi t}$$

41. page 383*, Problem **P-12.7** part (c), change minus sign to plus sign:

$$w(t) = \tfrac{1}{2} x_1(t)[1 + \cos(2\omega_c t)]...$$

42. page 383, Figure P-12.8, inside block (bad spacing)
LTI System

43. page 384, Figure P-12.9, inside block (bad spacing)
LTI System

44. page 392, before equation (13.8), lefthand column, (insert space)
.....equation (12.61) on p. 376, that the DTFT of...

45. page 410, top, lefthand column, section title should be:
13-8.2 Spectrograms in MATLAB

46. page 413*, Figure 13-20, Label on x-axis should be (sec) not (msec):
Time (sec)

47. page 414*, Figure 13-22, Label on x-axis should be (sec) not (msec):
Time (sec)

48. page 414*, Figure 13-23, Label on x-axis should be (sec) not (msec):
Time (sec)

49. page 438*, Figure A-13 (caption),
For the vectors shown, $|z_1| > 1$ and $|z_3| < 1$.

50. page 460, top line, lefthand column,
Use the built-in MATLAB editor, or an external one...

Optional:

1. page 26, The suggested change in wording was not made:
Change **LAB:** *#2, Adding Sinusoids and Complex Amplitudes*
to **LAB:** *#2 Introduction to Complex Exponentials*.
Note: this change was made correctly on page 31.

2. page 46, The CDROM citation should read:
DEMO: *Spectrograms: Simple Sounds: Square Wave*

3. page 68, Problem **P-3.15** (b), top of the right hand column.
It would make a better problem to define $y(t)$ as $2x(t-T_0/4)$ because then the shifted square wave has its jumps at $t = 0$ and $t = T_0/2$ like the example worked out in Section 3-6.1.

4. page 416, The CDROM citation should read:
DEMO: *Ch 3, Spectrograms*

5. page 381, in Problems **P-12.2** and **P-12.3** it should be stated that $\omega_{co1} < \omega_{co2}$.

CD-ROM Errata:

1. Exercise 3.8 solution is wrong because the $k = 3$ term was evaluated incorrectly. The last two lines should be:

$$x_N(t) = \frac{1}{2} - \frac{2}{\pi}\, e^{j50\pi t} - \frac{2}{\pi}\, e^{-j50\pi t} - \frac{2}{3^2\pi}\, e^{j150\pi t} - \frac{2}{3^2\pi}\, e^{-j150\pi t}$$

$$= \frac{1}{2} - \frac{4}{\pi}\cos(50\pi t) - \frac{4}{9\pi}\cos(150\pi t)$$

2. Exercise 7.6 solution was not consistent with the printed version (1st and 2nd printing) of the text. However, the error is with the text, so the solution is not changed.